

## CLAIMS

What is claimed is:

1. A pipette mandrel for engagement with the interior wall of a pipette tip, the pipette mandrel comprising:
  - 5 a. an elongated hollow structure, the hollow structure including a proximate end and a distal end;
  - b. a lead-in portion formed on the distal end of the hollow structure;
  - c. a first cylindrical portion adjacent to the lead-in portion, the first cylindrical portion having a first exterior diameter;
  - 10 d. a second cylindrical portion adjacent to the first cylindrical portion, the second cylindrical portion having a second exterior diameter;
  - e. a first raised band positioned upon the first cylindrical portion, the first raised band having a diameter greater than the first exterior diameter of the first cylindrical portion, the first raised band for contacting the interior wall of the pipette tip to form a first seal between the first raised band and the pipette tip.
- 15 2. The pipette mandrel of claim 1 wherein the first raised band is adjacent to the lead-in portion such that the lead-in portion tapers into the first raised band.
3. The pipette mandrel of claim 1 further comprising a second raised band positioned upon the second cylindrical portion, the second raised band having a diameter greater than 20 the second exterior diameter of the second cylindrical portion.
4. The pipette mandrel of claim 3 wherein the second raised band contacts the interior wall of the pipette tip to form a second seal between the second raised band and the pipette tip.

5. The pipette mandrel of claim 4 further comprising a taper between the first and second cylindrical portions.
6. The pipette mandrel of claim 5 wherein the second raised band is positioned on the end of the second cylindrical portion substantially adjacent to the taper.

- 5 7. A pipette assembly comprising:
- a. a pipette tip including a collar portion and an adjacent conical head, the conical head for receiving or expelling fluids from the tip, the collar portion including an interior cylindrical wall having a first interior diameter;
- b. a hollow mandrel having a proximate end and a distal end, the mandrel comprising:
- (1) a lead-in portion formed on the distal end of the mandrel;
- (2) a first cylindrical portion adjacent to the lead-in portion, the first cylindrical portion having a first exterior diameter;
- (3) a first raised band positioned upon the first cylindrical portion, the first raised band having a diameter greater than the first exterior diameter of the first cylindrical portion, the first raised band contacting the interior cylindrical wall of the collar portion to form a first seal between the mandrel and the pipette tip.

8. The pipette assembly of claim 7 wherein the interior cylindrical wall of the collar portion of the pipette tip comprises a first step portion defining the first interior diameter and the collar portion of the pipette tip further comprises a second step portion defining a second interior diameter.

9. The pipette assembly of claim 8 wherein the interior cylindrical wall of the pipette tip further comprises a positive stop.

10. The pipette assembly of claim 9 wherein a flange between the collar portion and conical head is the positive stop.

11. The pipette assembly of claim 9 wherein a puller ring on the interior wall of the  
5 pipette tip is the positive stop.

12. The pipette assembly of claim 11 wherein the collar portion of the pipette tip further comprises vertical ribs positioned on the exterior of the collar portion of the pipette tip.

13. The pipette assembly of claim 7 wherein the mandrel further includes a second cylindrical portion adjacent to the first cylindrical portion, the second cylindrical portion  
10 having a second exterior diameter.

14. The pipette assembly of claim 13 wherein the mandrel further includes a second raised band positioned upon the second cylindrical portion, the second raised band having a diameter greater than the second exterior diameter of the second cylindrical portion.

15. The pipette assembly of claim 14 wherein the second raised band contacts the interior cylindrical wall of the collar portion to form a second seal between the mandrel and the  
15 pipette tip.

16. A method for connecting a pipette mandrel to a pipette tip comprising:

- a. providing a pipette tip comprising a collar portion and an adjacent conical head, the conical head for receiving or expelling fluids from the tip, the collar portion including an interior cylindrical wall having a first interior diameter;
- b. providing a hollow mandrel having a proximate end and a distal end, the mandrel comprising:

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- (1) a lead-in portion formed on the distal end of the mandrel;
  - (2) a first cylindrical portion adjacent to the lead-in portion, the first cylindrical portion having a first exterior diameter;
  - (3) a first raised band positioned upon the first cylindrical portion, the first raised band having a diameter greater than the first exterior diameter of the first cylindrical portion;
- c. inserting said pipette tip onto said mandrel such that the first raised band contacts the interior cylindrical wall of the collar portion to form a first seal between the mandrel and the pipette tip.

10 17. The method of claim 16 wherein the mandrel further includes a second raised band positioned upon the second cylindrical portion, the second raised band having a diameter greater than the second exterior diameter of the second cylindrical portion, and said step of inserting said pipette tip onto said mandrel includes the second raised band contacting the cylindrical wall of the collar portion to form a second seal between the mandrel and the pipette tip.

15 18. The method of claim 16 comprising the step of removing the pipette tip from the mandrel such that the first raised band disengages the interior cylindrical wall of the collar portion.